

(Prior art)

Figure 1

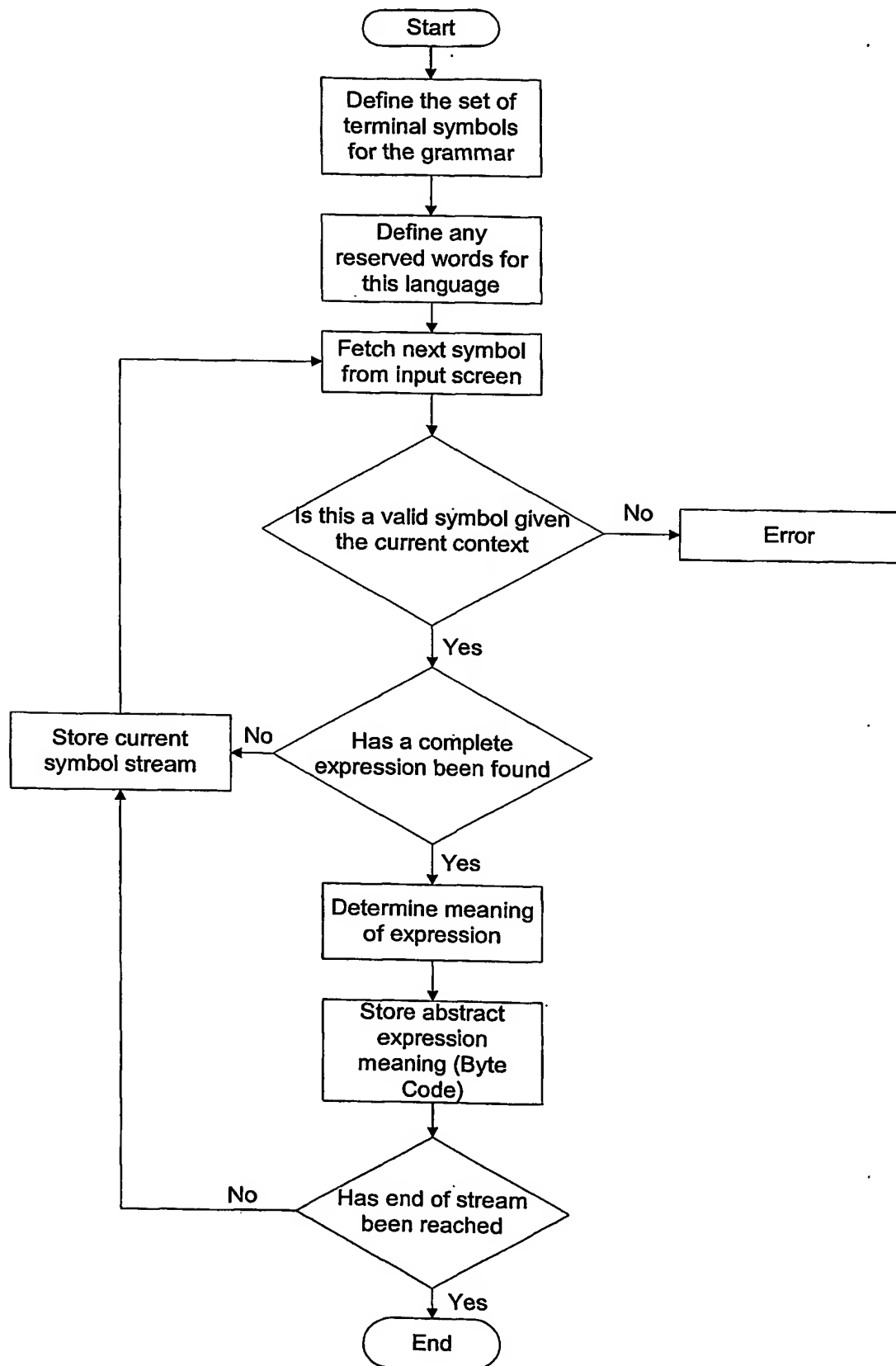


Figure 2

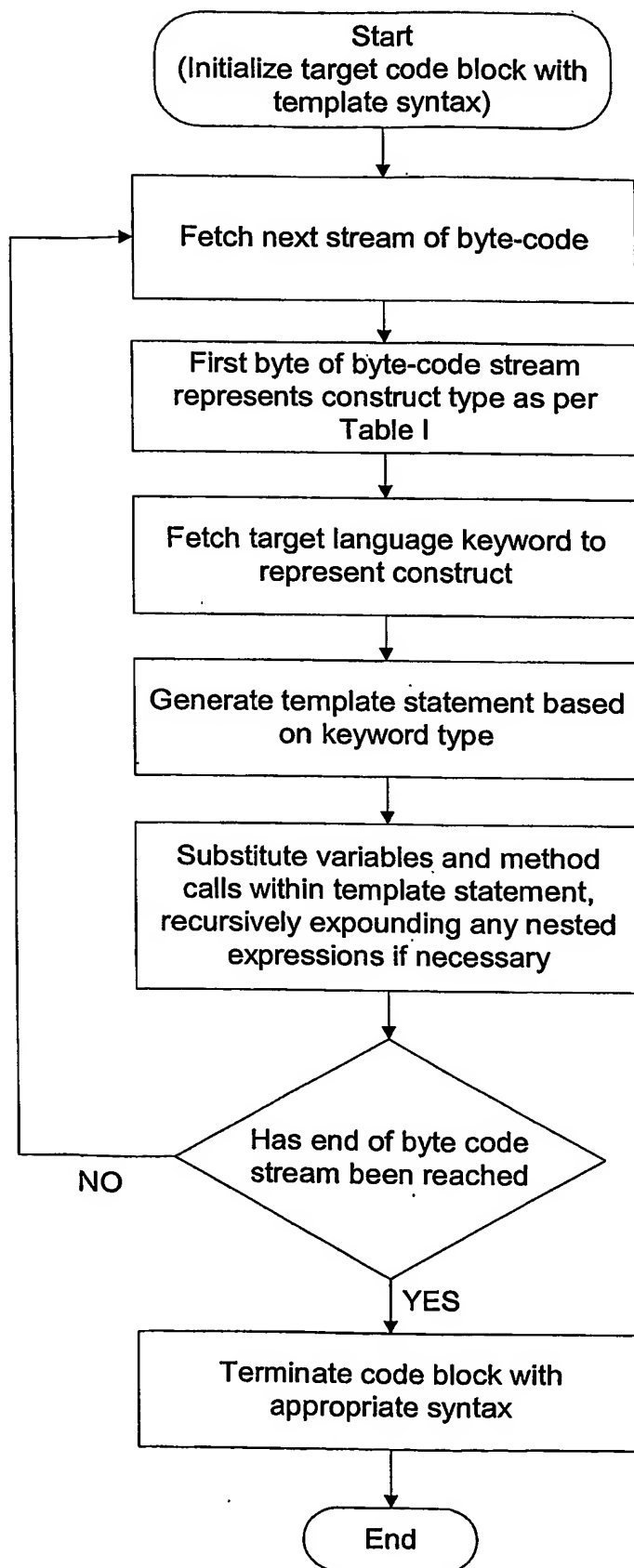


Figure 3

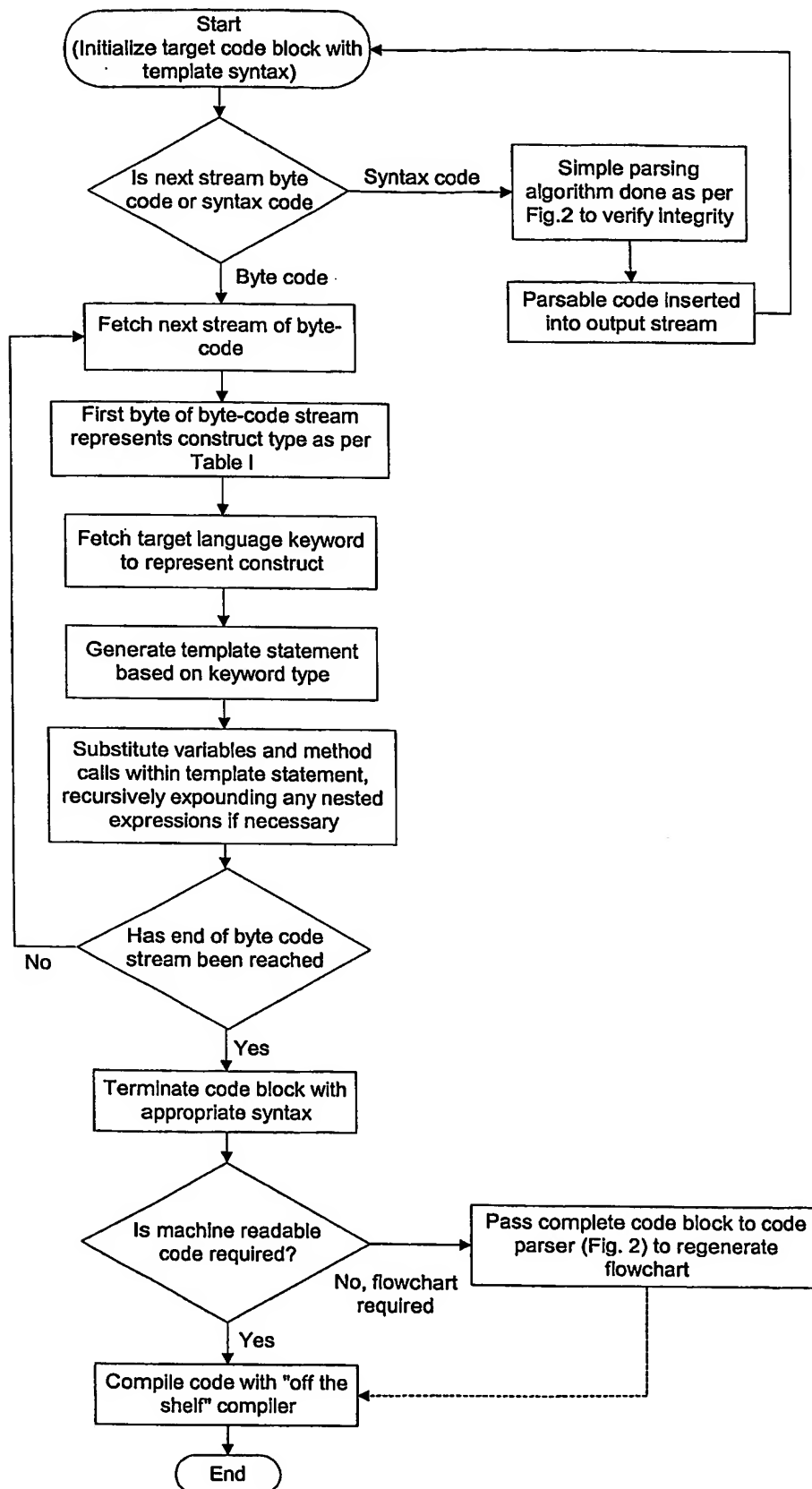


Figure 4

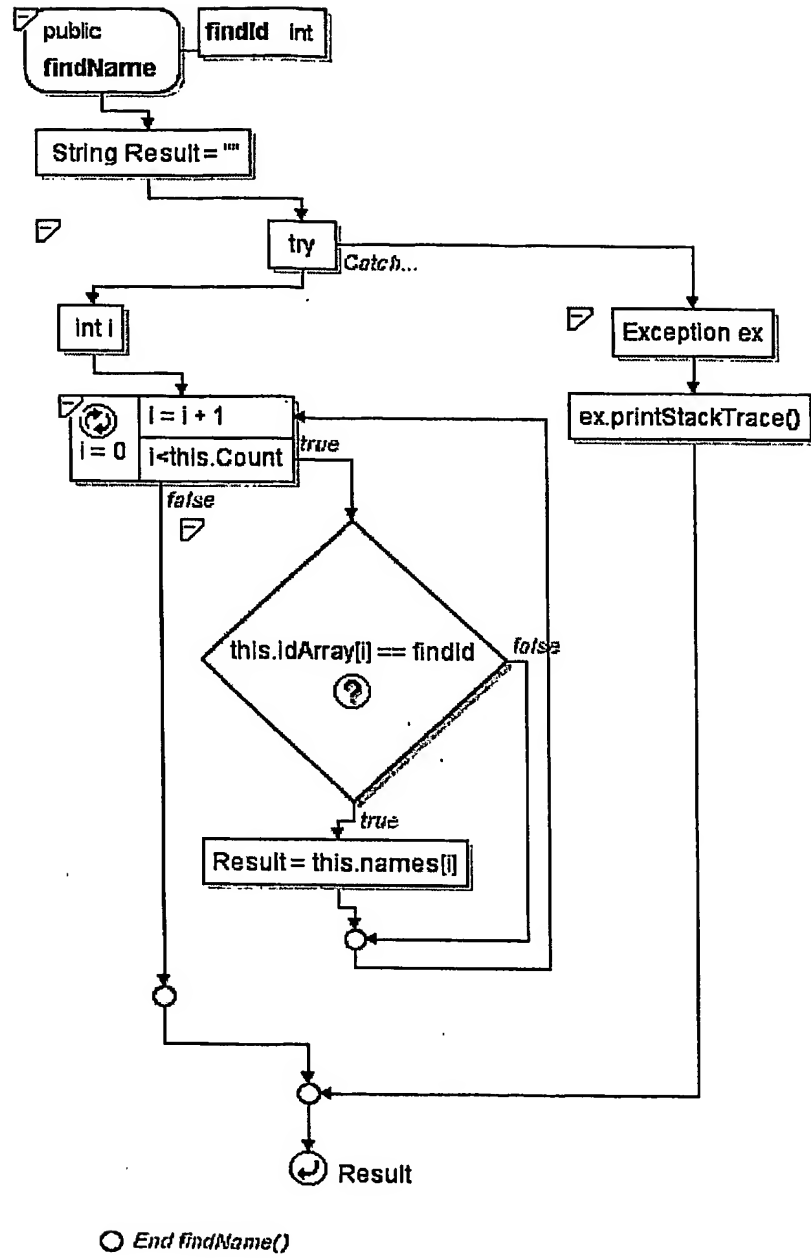


Figure 5

```
public class test {  
  
    //fields:  
    private int[] idArray =  
    {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};  
    private int Count = 10;  
  
    //Methods:  
    public String findName(int findId){  
        String Result = "";  
  
        try {  
            int i;  
  
            for (i = 0; i < this.Count; i = i + 1) {  
                if (this.idArray[i] == findId) {  
                    Result = this.names[i];  
                }  
            }  
  
        } catch (Exception ex) {  
            ex.printStackTrace();  
        }  
  
        return Result;  
    }  
}
```

Figure 6

```
public class test {  
  
    //Fields:  
    private int[] idArray =  
    {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};  
    private int Count = 10;  
  
    //Methods:  
    public String findName(int findId){  
        String Result = "";  
  
        try {  
            int i;  
  
            for (i = 0; i < this.Count; i = i + 1) {  
                if (this.idArray[i] == findId) {  
                    Result = this.names[i];  
                }  
            }  
  
            //Inserted Code  
            if (Result.equals(""))  
            {  
                Result = "<not found>";  
            }  
            //End of Inserted Code  
  
        } catch (Exception ex) {  
            ex.printStackTrace();  
        }  
  
        return Result;  
    }  
}
```

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Flowchart: test Editor: test

Figure 7

Global Symbols:

Id	Name	Scope	Type

#1	idArray	private	Array of int
#2	Count	private	int
#3	names	private	Array of String

Local Symbols:

Id	Name	Scope	Type

@1	Result	local	String
@2	findID	Parameter	int
@3	i	local	int

ByteCode:

bytecode	Equivalent Code

0x080x15 (@3=0;@3<#2;@3=@3 + 1) length of Expression (in Hex) // Initializer: i = 0 // Condition: i IsLessThan Count // Step: i = i + 1;	//For-Loop: 0x15 is
0x030x0C (#1[@3]==@2) names[i]	//If Result IsEqualTo
0x120x0B (@1=#3[@3]) names[i]	//Set Value: Result =
0x04	//End If
0x09	//End For-Loop
//byte code resulting from inserted Code	
0x030x08 (@1=="")	//If Result IsEqualTo ""
0x12x12 (@1="<not found>") "<not found>"	//Set Value: Result =
0x04	//End If
//End of byte code resulting from inserted Code	

Figure 8

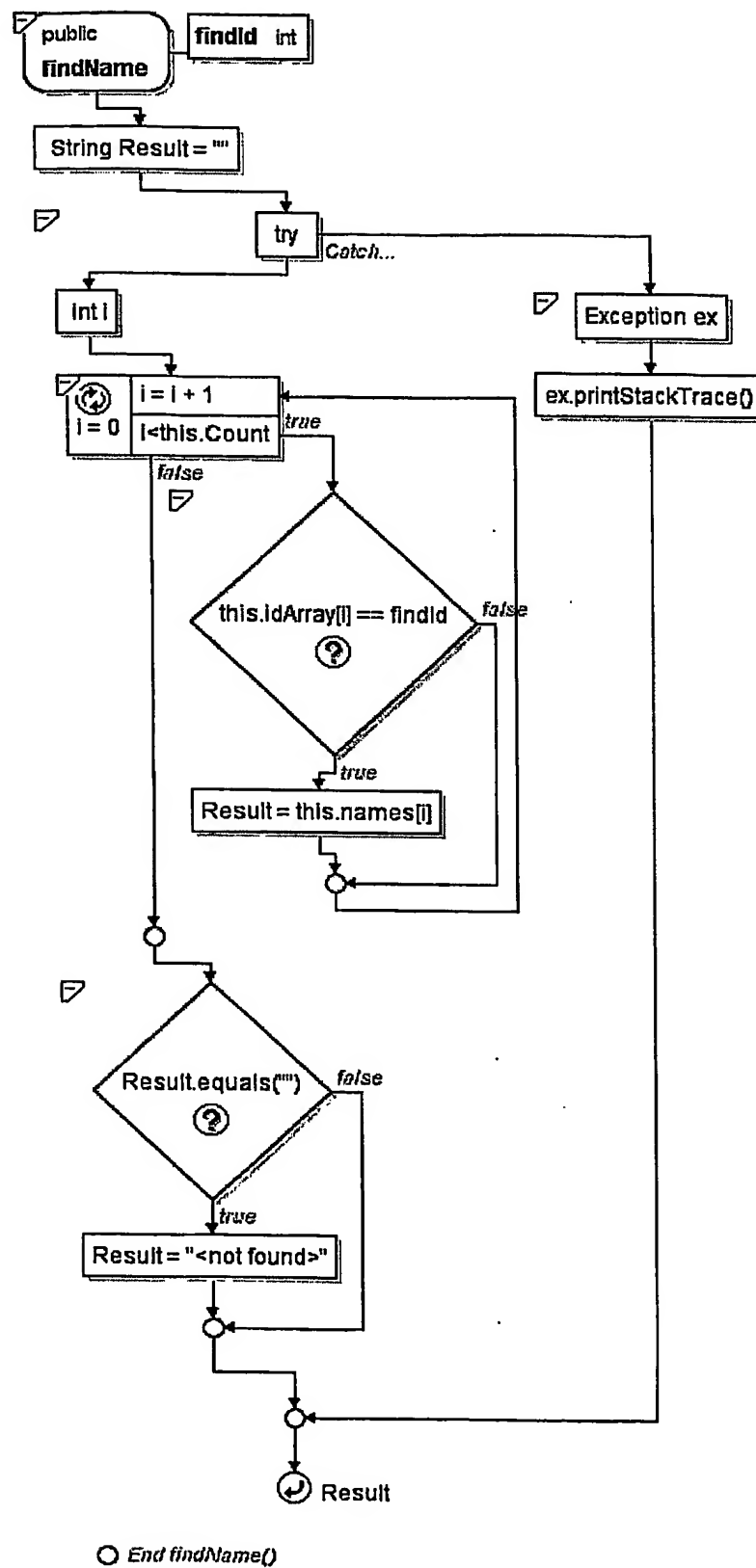


Figure 9

```
public class test {  
    //Fields:  
    private int[] idArray =  
    {0, 1, 2, 3, 4, 5, 6, 7, 8, 9};  
    private int Count = 10;  
  
    //Methods:  
    public String findName(int findId){  
        String Result = "";  
  
        try {  
            int i;  
  
            for (i = 0; i < this.Count; i = i + 1) {  
                if (this.idArray[i] == findId) {  
                    Result = this.names[i];  
                }  
            }  
  
            if (Result != null && Result.equals(""))  
            {  
                Result = "<not found>";  
            }  
        } catch (Exception ex) {  
            ex.printStackTrace();  
        }  
  
        return Result;  
    }  
}
```

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Elbowchart test Editor test

Figure 10

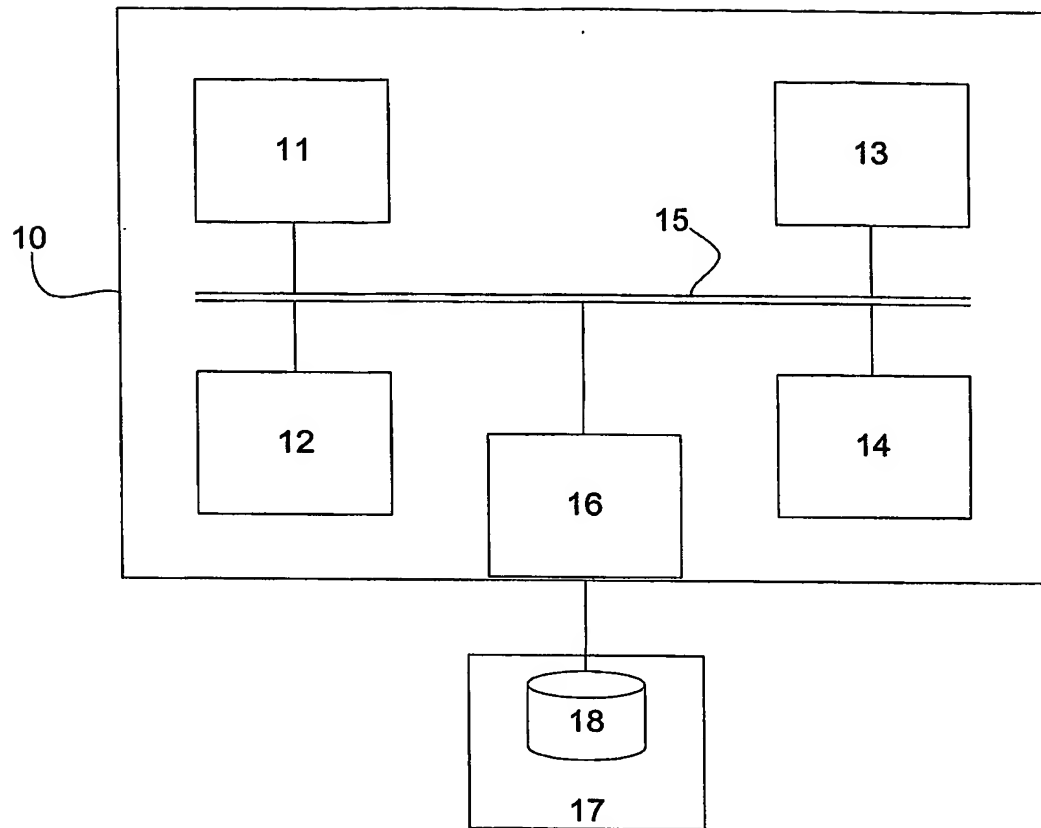


Figure 11

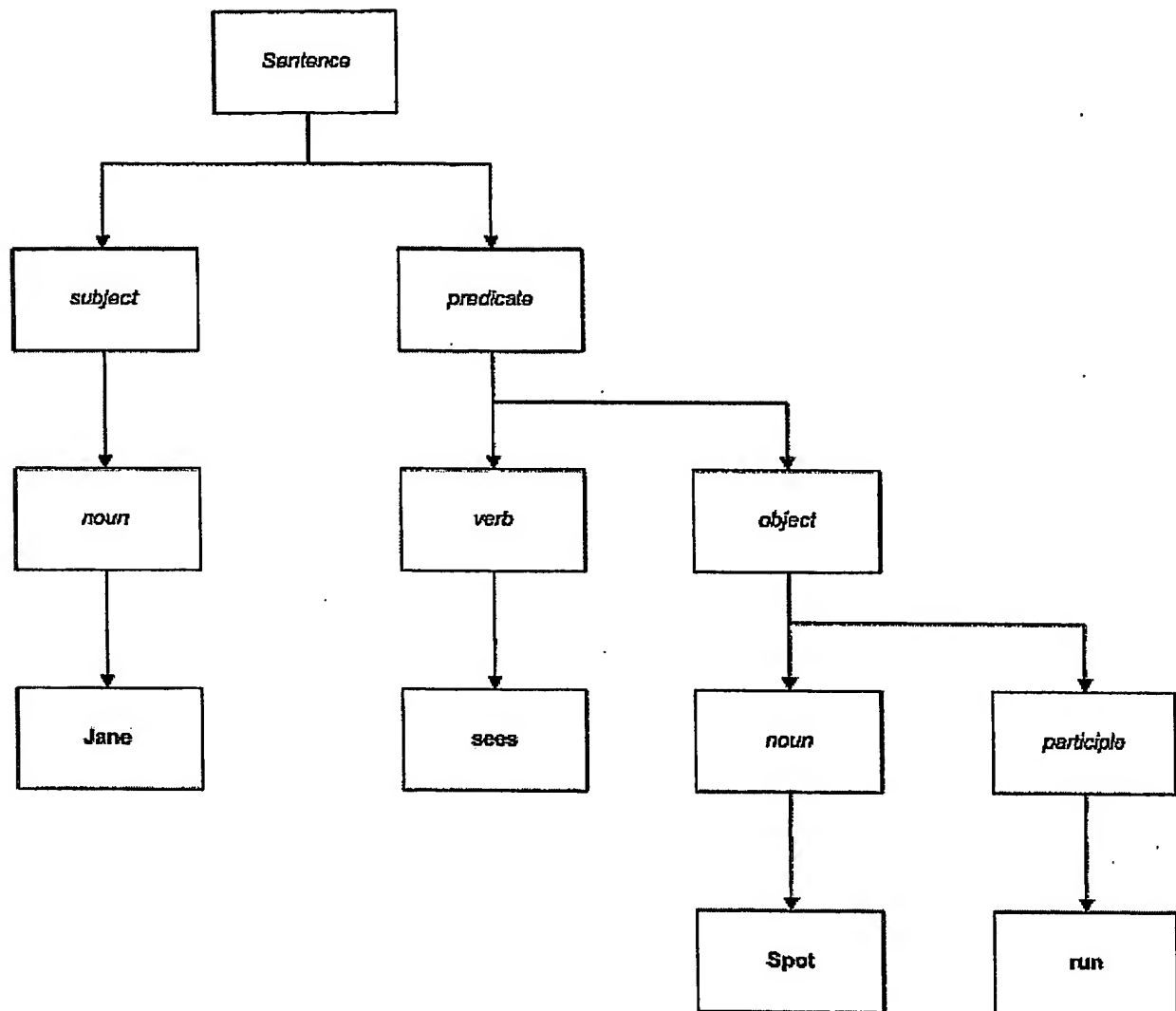


Figure 12



Figure 13

